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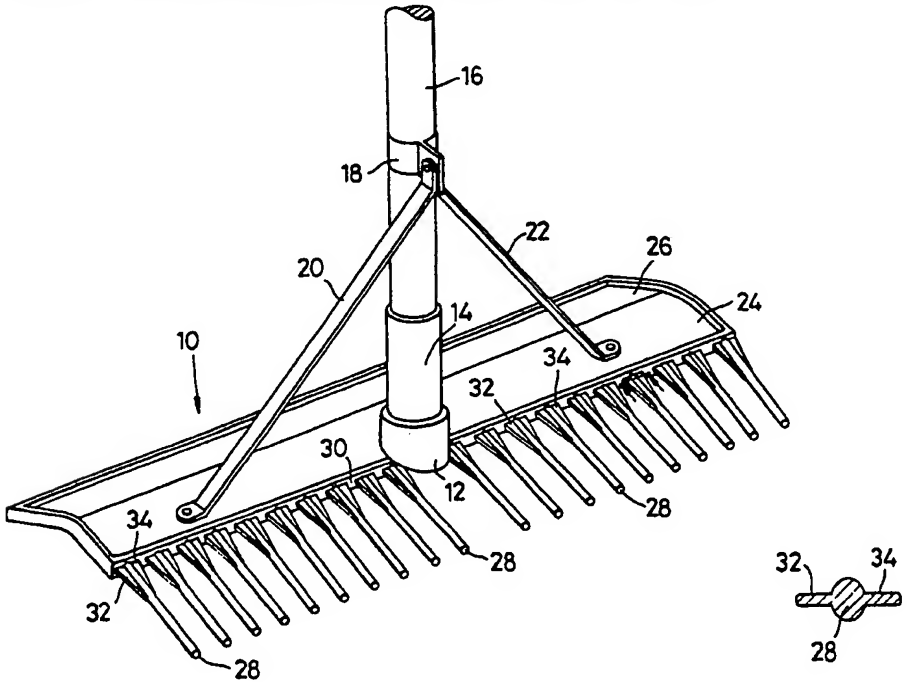
(54) Cast alloy rake head

(57) The invention provides a cast alloy rake head which is especially adapted for construction using a light alloy consisting principally of aluminium or magnesium. A rake head 10 has a socket 12 including an upwardly projecting tube 14 to provide support for a cylindrical or tubular handle 16. The handle 16 is additionally supported by two stabiliser struts 20, 22 and an associated clip 18 so as to reduce the tendency of the head 10 to bend or warp. The rake head 10 is formed of a first portion 24 which carries the socket 12 and a plurality of oval tines 28 extending laterally from a transverse edge 30. Each tine 28 is provided with supporting webs 32, 34 of generally triangular shape and extending along each side of a respective tine 28. The tines 28 are thus strengthened against breakage by forces acting in the direction of the transverse edge during use. A second portion 26 of the rake head is angled with respect to the first portion 24 so as to provide a scraper, by reversal of the head 10, and also reduce the flexibility of the rake head during usage.



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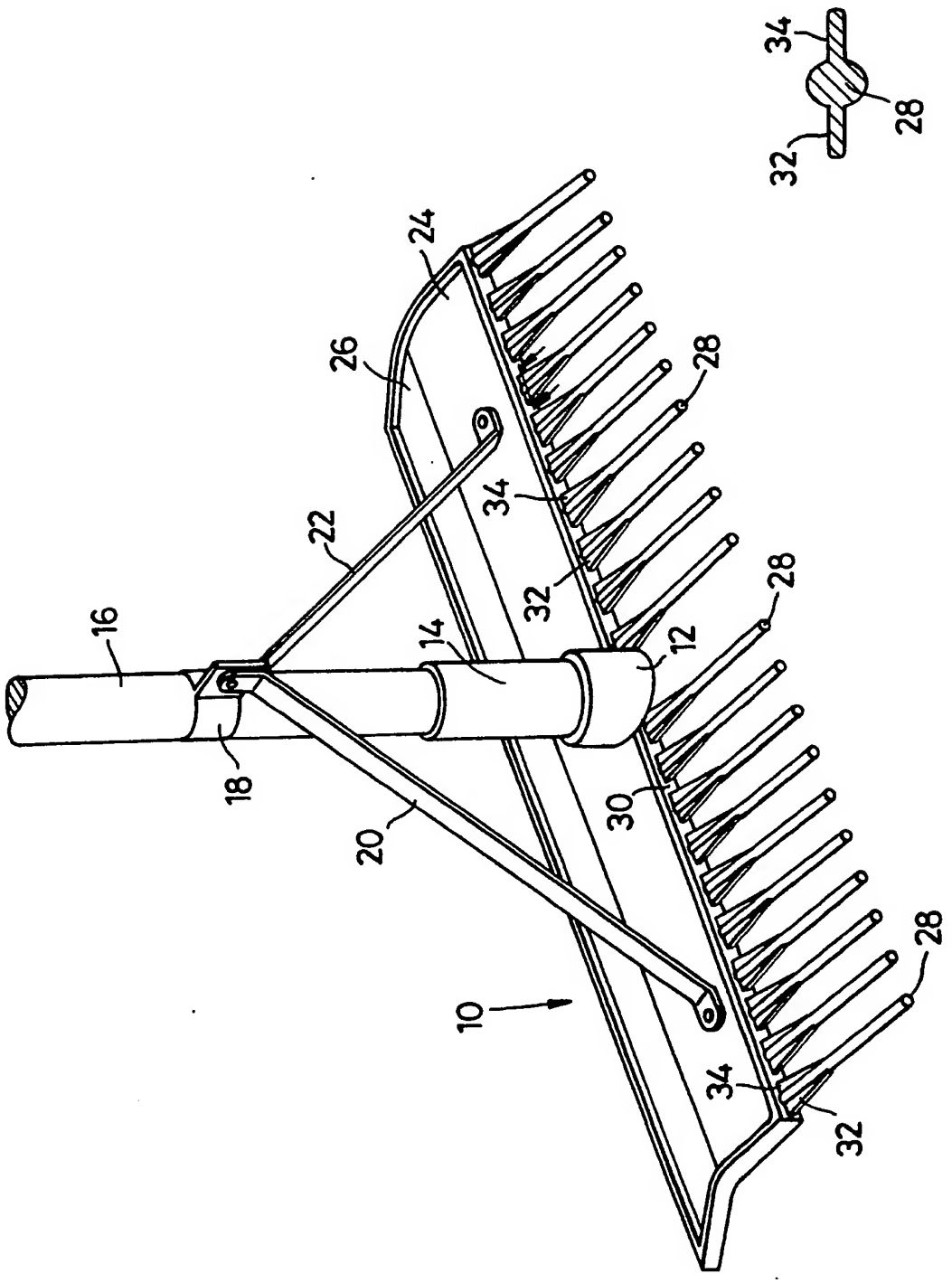
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CAST ALLOY RAKE HEAD

This invention relates to a cast alloy rake head especially of a light alloy containing aluminium or magnesium.

Metal rakes of, for example, iron or steel are commonly known and used for a variety of purposes. In known constructions a rigid metal head is attached to a handle of, for example, metal, wood or plastics to form the implement in question. Such rake heads are formed in various ways, for example, cast iron etc. One of the problems with the use of iron or steel is that where a large head is required for the implement the weight of the overall article becomes excessively heavy and difficult to manipulate.

In order to overcome this problem of excessive weight it has been known to use light alloys consisting substantially of aluminium or of magnesium to form relatively large heads for rakes. As aluminium (or magnesium) has a much lower relative density compared to iron or steel a rake having a light overall weight may be constructed having a relatively large head for example as would be required for industrial uses.

One of the disadvantages in using light alloys however, are their relative brittleness and their tendency to break or bend when subjected to relatively low forces. In the commonly known rake design this leads to a tendency for the rake's tines to break easily and hence to render the rake of less use.

It is an object of the invention therefore to provide a cast alloy rake which is formed so as to be structurally stronger and more rigid than heretofore

possible.

With this object in view the present invention provides a cast alloy rake head having a socket adapted for engagement with one end of a handle and a head piece connected transversely to the socket such that it is substantially perpendicular thereto, the head piece carrying along one transverse edge a plurality of tines which are each oval in cross-section and provided with support webs at their junction with the transverse edge, two of the plurality of tines and their associated webs being located at each of the edge's outer ends and being larger in cross-section than the other tines and webs, all of the tines being carried by the head piece such that they are at an angle of more than 90° to the socket's axis.

Advantageously the rake head is cast from a light alloy which consists principally of aluminium or of magnesium.

Preferably the head piece is provided in two portions. A first portion carrying the socket and the plurality of tines and a second portion arranged at an angle relative to the first portion and also such that the second portion is substantially at 90° to the socket's axis.

Such a construction overcomes the problems inherent in cast alloy rake heads in that the tines are additionally reinforced by the webs to prevent breakage and the rake head itself is stronger, and supported by, the angled second portion. Furthermore, by turning the rake head over the rake head may be used as a scraper or similar implement using the flat edged angled second portion as required. The increased support on the two outermost tines reflect the fact that these two tines

are most likely to break during use.

Preferably the oval shaped tines are disposed on the rake head's transverse edge such that the smallest cross-sectional area of the oval is presented respectively forwardly and rearwardly of the transverse edge. In this way the greatest strength in the tine is arranged to resist a respectively forward or backward movement of the rake head so as to promote lengthened tine wear. Alternatively the tines may be of cruciform cross section.

In order to maintain a consistent perpendicular relationship between the rake head and a handle inserted and secured into the socket, the rake head preferably includes at least one stabiliser connected at one respective end to the rake head preferably at a point distant from the socket connection and provided at its other end with a clamp operative to secure the stabiliser to a handle. Advantageously two such stabilisers are provided one on each side of the socket extending at approximately 60° upwardly from the rake head for attachment to a handle.

Preferably one or each of the stabilisers is of a strip metal configuration twisted substantially about its centre point so as to provide increased rigidity and resistance to stress.

In order to provide a secure retainer for a handle the socket is formed integrally with the head. To achieve the maximum weight saving however it is preferably to additionally cast in a short section, e.g. 4", of extruded aluminium tube. This provides for secure fastening of a handle to the rake head and the tubular aluminium provides longitudinal support for a significant portion of the handle which support is

resistant to flexing or similar stress or strain between the handle and the rake head. The handle involved may be of any convenient material, for example, plastic, wood or tubular metal, if so desired.

The invention will be described further by way of example with reference to the accompanying drawing in which:

Fig. 1 is a perspective view of a first preferred embodiment of the cast aluminium rake head; and

Fig. 2 is a sectional view taken along he line II-II of Fig. 1.

In Fig. 1 a cast rake head 10 is provided with a socket 12 of generally circular cross-section. The rake head 10 and socket 12 are cast integrally of a light alloy consisting substantially of either aluminium or magnesium. Into this socket 12 is cast a short length of aluminium tube 14. The aluminium tube 14 is preferably located during the casting process such that the socket 12 is formed integrally therewith and is rigidly supported by the socket 12. The aluminium tube is, therefore, of course, non-removable.

A handle 16 is inserted into the tube 14. The handle 16 may be of any convenient material, for example, wood, plastic or tubular metal depending on the strength and rigidity required during use. The handle 16 may be secured within the tube 14 by any convenient clamping arrangement or by insertion of a screw (not shown) through the tube 14 into the handle 16. Stabiliser struts 20 and 22, preferably made from extruded aluminium, are provided with the object of enhancing the lateral stability of the rake head with

respect to the handle. These are secured to the handle 16 by a circular clip 18 which is adapted to fit around the handle's shaft at a distance from the tube 14. The clip 18 is provided with fastening means (not shown in detail) so that it may be releasably secured to the handle shaft. The stabiliser struts 20, 22, are adapted at their free ends to be securely attached to the rake head 10, for example, by riveting or welding. In this way the handle 16 is securely attached to the rake head 10 and the struts 20, 22 transmit the reaction forces exerted on the free ends of the rake head from bending when the rake is pulled or pushed along the ground thereby inhibiting any tendency to bend or warp.

The rake head 10 is formed as a shallow V-shape cross-section defining two portions. A first portion 24 carries the socket 12 and attachment points for the two stabiliser struts 20, 22. A second portion 26 is arranged at a shallow angle to the first portion 24. The socket 12, and tube 14, are also arranged at an angle to the first portion 24 and, furthermore, the second portion 26 is preferably arranged to be at substantially right angles to the handle's axis. In this way the second portion's edge may be used as a scraper to collect and push or pull particulate matter etc. as desired.

The first portion 24 carries a plurality of tines 28 arranged to project from one transverse edge 30. These tines 28 are each oval in cross-section and are provided with supporting webs 32, 34 of generally triangular shape and arranged at each side of a respective tine 28 at its junction with the edge 30 (see Fig. 2). Thus the tines 28 are strengthened against breakage by forces acting in the direction of the edge 30.

The support webs 32, 34 extend from the edge 30 to

substantially half the length of the tine 28 although this may be varied according to the specific requirement for strengthening. As the two endmost tines are most likely to be broken during use the cross-section of each of these tines 28 is larger than that of the other tines and additionally the support webs 32, 34 formed integrally with these tines are larger in cross-section and extend for substantially the whole length of the tine 28. In the preferred embodiment of the invention thereof there are eighteen tines in total formed at an equidistant spacing along the transverse edge.

The tines 28 are arranged such that their central axes are substantially in line with the first portion 24 of the rake head 10 to which they are attached. As the first portion 24 is arranged at a predetermined angle to the axis of the handle 16 it will be apprecicated that the tines 28 are also arranged at that angle with respect to the handle 16. In this way when the rake is used the handle will normally be held at a shallow angle to the ground level and the tines 28 will be substantially vertical for optimum material collection.

The invention is not confined to the foregoing details and variations may be made thereto within the scope of the invention. For example, the stabiliser bars 20, 22 may be twisted along their length to provide additional torsional strength. The number of tines may be greater or lower then illustrated depending on the actual size of the rake head and the size of the material which the rake is expected to collect. Other variations are also possible.

CLAIMS

1. A cast alloy rake head having a socket adapted for engagement with one end of a handle and a head piece connected transversely to the socket such that it is substantially perpendicular thereto, the head piece carrying along one transverse edge a plurality of tines which are each oval in cross-section and provided with support webs at their junction with the transverse edge, two of the plurality of tines and their associated webs being located at each of the edge's outer end and being larger in cross-section then the other tines and webs, all of the tines being carried by the head piece such that they are at an angle of more than 90° to the socket's axis.

2. A cast alloy rake as claimed in claim 1 in which the rake head is cast from a light alloy which consists principally of aluminium.

3. A cast alloy rake as claimed in claim 1 in which the rake head is cast from a light alloy which consists principally of magnesium.

4. A cast alloy rake as claimed in claims 1 to 3 in which the head piece is provided in two portions, a first portion carrying the socket and the plurality of tines and a second portion arranged at an angle relative to the first portion, the second portion being further arranged to be substantially at 90° to the socket's axis.

5. A cast alloy rake as claimed in any preceding claim in which the oval shaped tines are disposed on the rake head edge such that the smallest cross-sectional area of the oval is presented respectively forwardly and rearwardly of the edge.

6. A cast alloy rake as claimed in any preceding claim which includes at least one stabilisier connected at one respective end to the rake head and provided at its other end with a clamp operative to secure the stabiliser to a handle.

7. A cast alloy rake as claimed in claim 6 in which two such stabilisers are provided, one on each side of the socket extending at approximately 60° upwardly from the rake head for attachment to a handle.

8. A cast alloy rake as claimed in claims 6 or 7 in which one or each of the stabilisers is of a strip metal configuration, twisted substantially about its centre point.

9. A cast alloy rake as claimed in any preceding claim in which the socket is formed integrally with the head.

10. A cast alloy rake as claimed in any preceding claim in which the socket is at least partially provided by a short section of extruded aluminium tube.

11. A cast alloy rake substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.

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